

264975

FYI-0303-01445



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Institutes of Health
National Institute of
Environmental Health Sciences
P. O. Box 12233
Research Triangle Park, NC 27709

March 06, 2003

Document Control Office (7407)
Attn: TSCA Section 8(e) Or (FYI)
Room G99 East Tower
Ofc. Of Pollution Prevention & Toxics
401 M St SW
Washington, DC 20460-0001

Dear Document Control Office :

In compliance with the National Toxicology Program's (NTP) mission to keep our colleagues informed of the current NTP findings during ongoing studies, a copy of the *updated* Summary Pathology Tables for the chronic inhalation rat study on PROPYLENE GLYCOL MONO-T-BUTYL ETHER (57018-52-7) are enclosed for your review.

The PWG review of the data from the chronic study of propylene glycol mono-t-butyl ether in male and female rats indicated increased incidences of basophilic foci in female rats, the incidences in control and treated animals of both sexes seemed to be unusually low when compared to previous studies. The NTP decided to have a pathologist re-evaluate the livers from all groups of male and female rats for the presence of basophilic foci. During this re-evaluation, numerous additional instances of basophilic foci were identified in all groups of male and female rats including controls. The enclosed pathology reports reflect the additional findings.

Please contact Central Data Management (CDM) at (919)541-3419 if you have any questions. You may also fax your requests for information to CDM at (919)541-3687 or send them via e-mail to cdm@niehs.nih.gov.

Sincerely,

William Eastin, Ph.D.
Head, Information Systems & Central Files
Environmental Toxicology Program

Contain NO CBI



Encl: Updated Pathology Summary Tables
cc: Central Data Management

2003 MAR 20 AM 11:18
RECEIVED
OPPT/TOXIS



Contain NO CBI

NTP Experiment-Test: 90004-07
Study Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
Date: 03/05/03
Time: 14:06:33

Facility: Battelle Northwest
Chemical CAS #: 57018-52-7
Lock Date: 12/11/00
Cage Range: All
Reasons For Removal: All
Removal Date Range: All
Treatment Groups: Include All

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS FEMALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|----------------------------------|---------|--------|---------|----------|
| Animals Initially In Study | 50 | 50 | 50 | 50 |
| Early Deaths | 14 | 12 | 20 | 11 |
| Moribund Sacrifice | 3 | 4 | 2 | 3 |
| Natural Death | | | | |
| Survivors | 33 | 34 | 28 | 36 |
| Terminal Sacrifice | | | | |
| Animals Examined Microscopically | 50 | 50 | 50 | 50 |

DISPOSITION SUMMARY

| ALIMENTARY SYSTEM | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|-----------------------------|-----------|----------|----------|-----------|
| Liver | (49) | (50) | (50) | (50) |
| Angiectasis | 1 (2%) | | 3 (6%) | 1 (2%) |
| Basophilic Focus | 39 (80%) | 45 (90%) | 43 (86%) | 40 (80%) |
| Clear Cell Focus | 12 (24%) | 13 (26%) | 11 (22%) | 27 (54%) |
| Eosinophilic Focus | 1 (2%) | | | 1 (2%) |
| Fatty Change | | 1 (2%) | | |
| Hepatodiaphragmatic Nodule | 8 (16%) | 10 (20%) | 9 (18%) | 7 (14%) |
| Infarct | 1 (2%) | | | |
| Inflammation, Granulomatous | 1 (2%) | 1 (2%) | 1 (2%) | 2 (4%) |
| Necrosis | | | | 2 (4%) |
| Thrombosis | | | | 1 (2%) |
| Vacuolization Cytoplasmic | 3 (6%) | 4 (8%) | 3 (6%) | |
| Bile Duct, Dilatation | 1 (2%) | | | |
| Serosa, Hemorrhage | 1 (2%) | | | |
| Mesentery | (17) | (23) | (10) | (17) |
| Necrosis | 17 (100%) | 21 (91%) | 9 (90%) | 17 (100%) |
| Fat, Hemorrhage | 1 (6%) | 1 (4%) | | |
| Pancreas | (49) | (50) | (50) | (50) |
| Cyst | | | 1 (2%) | |
| Necrosis | (49) | 1 (2%) | (50) | (49) |
| Stomach, Forestomach | | | | 1 (2%) |
| Erosion | | | | 1 (2%) |
| Inflammation, Suppurative | | | | 4 (8%) |
| Ulcer | (49) | (50) | (50) | (49) |
| Ulcer | 1 (2%) | | | |
| Epithelium, Hyperplasia | (2) | | | 1 (2%) |
| Epithelium, Hyperkeratosis | | | | 1 (1%) |
| Epithelium, Hyperplasia | 1 (50%) | | | 1 (100%) |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS FEMALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|--|----------|----------|---------|----------|
| ALIMENTARY SYSTEM - CONT | | | | |
| Tooth | (1) | | | |
| Peridental Tissue, Inflammation | 1 (100%) | | | |
| CARDIOVASCULAR SYSTEM | | | | |
| Heart | (50) | (50) | (50) | (50) |
| Cardiomyopathy | | | 1 (2%) | |
| Atrium, Thrombosis | | 3 (6%) | | |
| Epicardium, Inflammation, Chronic | | 2 (4%) | | |
| Myocardium, Degeneration | | | 1 (2%) | |
| Myocardium, Necrosis | | | 1 (2%) | |
| ENDOCRINE SYSTEM | | | | |
| Adrenal Cortex | (49) | (50) | (50) | (50) |
| Accessory Adrenal Cortical Nodule | | | | 1 (2%) |
| Atrophy | | 1 (2%) | | |
| Degeneration, Cystic | | | | |
| Hemorrhage | | | 1 (2%) | |
| Hyperplasia | 2 (4%) | | 2 (4%) | |
| Metaplasia, Osseous | 1 (2%) | | | |
| Vacuolization Cytoplasmic | 15 (31%) | | 6 (12%) | 5 (10%) |
| Adrenal Medulla | (49) | 10 (20%) | (50) | (50) |
| Hyperplasia | 1 (2%) | 1 (2%) | 2 (4%) | |
| Pituitary Gland | (49) | (50) | (50) | (49) |
| Angiectasis | 4 (8%) | 4 (8%) | 1 (2%) | 4 (8%) |
| Cyst | | | | 1 (2%) |
| Hemorrhage | 1 (2%) | | 1 (2%) | |
| Hyperplasia | 3 (6%) | 6 (12%) | 3 (6%) | 3 (6%) |
| Pars Intermedia, Vacuolization Cytoplasmic | | | | 1 (2%) |
| Thyroid Gland | (49) | (50) | (50) | (50) |
| C-Cell, Hyperplasia | 9 (18%) | 8 (16%) | 7 (14%) | 5 (10%) |
| GENERAL BODY SYSTEM | | | | |
| None | | | | |
| GENITAL SYSTEM | | | | |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS FEMALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|------------------------------|---------|---------|---------|----------|
| GENITAL SYSTEM - CONT | | | | |
| Clitoral Gland | (50) | (50) | (50) | (50) |
| Cyst | 2 (4%) | 3 (6%) | 1 (2%) | 4 (8%) |
| Hyperplasia | 3 (6%) | 3 (6%) | 2 (4%) | 2 (4%) |
| Inflammation, Chronic | 1 (2%) | 1 (2%) | 2 (4%) | 1 (2%) |
| Ovary | (50) | (50) | (50) | (50) |
| Cyst | 6 (12%) | 5 (10%) | 3 (6%) | 8 (16%) |
| Hemorrhage | | | 1 (2%) | |
| Uterus | (50) | (50) | (50) | (50) |
| Decidual Reaction | 1 (2%) | | | 1 (2%) |
| Hemorrhage | 1 (2%) | | | |
| Hemorrhage, Chronic | 1 (2%) | | | |
| Necrosis | | | 1 (2%) | |
| Endometrium, Hyperplasia | | | 1 (2%) | 2 (4%) |
| Endometrium, Ulcer | | | | 1 (2%) |

HEMATOPOIETIC SYSTEM

| | | | | |
|--|---------|--------|---------|---------|
| Lymph Node | (5) | (3) | (3) | (6) |
| Deep Cervical, Infiltration Cellular, Histiocyte | | | 1 (33%) | |
| Deep Cervical, Inflammation, Chronic | 1 (20%) | | | |
| Lymph Node, Bronchial | (9) | (4) | (10) | (5) |
| Angiectasis | 1 (11%) | | | 1 (20%) |
| Infiltration Cellular, Histiocyte | | | 1 (10%) | |
| Lymph Node, Mandibular | (1) | (2) | (2) | |
| Ectasia | | | 1 (50%) | |
| Lymph Node, Mesenteric | (50) | (50) | (50) | (50) |
| Fibrosis | | | 1 (2%) | |
| Hemorrhage | | | 1 (2%) | |
| Lymph Node, Mediastinal | (43) | (46) | (45) | (43) |
| Angiectasis | 3 (7%) | 1 (2%) | 1 (2%) | 2 (5%) |
| Fibrosis | | | 1 (2%) | |
| Hemorrhage | | | 1 (2%) | |
| Infiltration Cellular, Histiocyte | 1 (2%) | 2 (4%) | 4 (9%) | |
| Inflammation, Suppurative | | | 1 (2%) | |
| Pigmentation | | | | |
| Spleen | 3 (7%) | 1 (2%) | | |
| Accessory Spleen | (49) | (50) | (50) | (50) |
| Degeneration | 1 (2%) | 2 (4%) | | |
| Fibrosis | | | 1 (2%) | |
| Hematopoietic Cell Proliferation | | | | 2 (4%) |
| Hemorrhage | | | | 1 (2%) |

a Number of animals examined microscopically at site and number of animals with lesion

| FISCHER 344 RATS FEMALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|---|----------|----------|----------|----------|
| RESPIRATORY SYSTEM - CONT | | | | |
| Hemorrhage | 1 (2%) | 2 (4%) | | 1 (2%) |
| Inflammation, Chronic | 9 (18%) | 2 (4%) | 7 (14%) | 6 (12%) |
| Metaplasia, Osseous | | | 1 (2%) | |
| Thrombosis | 1 (2%) | | | |
| Alveolar Epithelium, Hyperplasia | 6 (12%) | 4 (8%) | 5 (10%) | 4 (8%) |
| Alveolus, Infiltration Cellular, Histiocyte | 15 (30%) | 9 (18%) | 13 (26%) | 20 (40%) |
| Alveolus, Proteinosis | 4 (8%) | | 3 (6%) | 2 (4%) |
| Bronchiole, Hyperplasia | 1 (2%) | 1 (2%) | | |
| Interstitialium, Fibrosis | 4 (8%) | 1 (2%) | 4 (8%) | 2 (4%) |
| Mediastinum, Inflammation, Granulomatous | (49) | (49) | 1 (2%) | (50) |
| Nose | 2 (4%) | 2 (4%) | | |
| Foreign Body | 4 (8%) | 2 (4%) | | |
| Inflammation, Suppurative | | | 5 (10%) | |
| Glands, Dilatation | | | | |
| Goblet Cell, Hyperplasia | | | | 4 (8%) |
| Nasolacrimal Duct, Inflammation, Suppurative | 1 (2%) | 1 (2%) | 4 (8%) | 3 (6%) |
| Olfactory Epithelium, Degeneration, Hyaline | 10 (20%) | 22 (45%) | 48 (96%) | 1 (2%) |
| Respiratory Epithelium, Hyperplasia | 2 (4%) | 1 (2%) | 1 (2%) | 1 (2%) |
| Pleura | (50) | (50) | (49) | (50) |
| Inflammation, Chronic | 15 (30%) | 10 (20%) | 11 (22%) | 17 (34%) |
| SPECIAL SENSES SYSTEM | | | | |
| Eye | | | | |
| Atrophy | (49) | (50) | (50) | (50) |
| Phthisis Bulbi | | | 2 (4%) | |
| Anterior Chamber, Sclera, Inflammation, Suppurative | 1 (2%) | | 1 (2%) | |
| Cornea, Edema | | | 1 (2%) | |
| Cornea, Inflammation, Chronic | | | 1 (2%) | 1 (2%) |
| Cornea, Mineralization | | | | 10 (20%) |
| Cornea, Necrosis | | | | 1 (2%) |
| Lens, Cataract | 1 (2%) | 4 (8%) | 3 (6%) | 1 (2%) |
| Lens, Mineralization | | 1 (2%) | | |
| Sclera, Inflammation, Suppurative | 1 (2%) | | | |
| Zymbal's Gland | (42) | (44) | (43) | (46) |
| Cyst | | | 1 (2%) | |
| Hyperplasia | | | 1 (2%) | |
| URINARY SYSTEM | | | | |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS FEMALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|--|----------|----------|----------|----------|
| URINARY SYSTEM - CONT | | | | |
| Kidney | (49) | (50) | (50) | (50) |
| Inflammation, Suppurative | | 2 (4%) | | |
| Nephropathy, Chronic | 45 (92%) | 45 (90%) | 45 (90%) | 49 (98%) |
| Cortex, Infarct | | | | 1 (2%) |
| Cortex, Renal Tubule, Accumulation, Hyaline Droplet | 1 (2%) | 2 (4%) | | 1 (2%) |
| Cortex, Renal Tubule, Hyperplasia | | | 1 (2%) | 1 (2%) |
| Pelvis, Mineralization | 13 (27%) | 5 (10%) | 7 (14%) | 3 (6%) |
| Pelvis, Transitional Epithelium, Hyperplasia | | 4 (8%) | | |
| Renal Tubule, Mineralization | | | 2 (4%) | |
| Urethra | | | | (1) |
| Transitional Epithelium, Hyperplasia | (49) | (50) | (50) | 1 (100%) |
| Urinary Bladder | 1 (2%) | | | (50) |
| Hemorrhage | | | | |
| Mineralization | | | 1 (2%) | |
| Ulcer | | | 1 (2%) | |
| Transitional Epithelium, Hyperplasia | 1 (2%) | 1 (2%) | | |
| Transitional Epithelium, Mineralization | | | 1 (2%) | |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISHER 344 RATS MALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|----------------------------------|---------|--------|---------|----------|
| DISPOSITION SUMMARY | | | | |
| Animals Initially In Study | 50 | 50 | 50 | 50 |
| Early Deaths | | | | |
| Morbund Sacrifice | 20 | 15 | 26 | 22 |
| Natural Death | 3 | 6 | 8 | 6 |
| Survivors | | | | |
| Terminal Sacrifice | 27 | 29 | 16 | 22 |
| Animals Examined Microscopically | 50 | 50 | 50 | 50 |

ALIMENTARY SYSTEM

| | | | | |
|----------------------------|-----------|----------|-----------|----------|
| Intestine Large, Rectum | (50) | (48) | (47) | (48) |
| Diverticulum | 1 (2%) | | | |
| Intestine Large, Cecum | (47) | (47) | (47) | (45) |
| Hemorrhage | | | 1 (2%) | |
| Necrosis | | 1 (2%) | | |
| Intestine Small, Duodenum | (48) | (47) | (47) | (47) |
| Epithelium, Hyperplasia | | | | 1 (2%) |
| Intestine Small, Jejunum | (47) | (47) | (42) | (46) |
| Epithelium, Hyperplasia | | | | 1 (2%) |
| Intestine Small, Ileum | (47) | (47) | (43) | (45) |
| Epithelium, Hyperplasia | | | | 1 (2%) |
| Liver | (50) | (50) | (49) | (50) |
| Basophilic Focus | 6 (12%) | 18 (36%) | 15 (31%) | 17 (34%) |
| Clear Cell Focus | 8 (16%) | 11 (22%) | 11 (22%) | 9 (18%) |
| Degeneration, Cystic | 1 (2%) | | 1 (2%) | 3 (6%) |
| Eosinophilic Focus | | | 1 (2%) | 2 (4%) |
| Fatty Change | 3 (6%) | | 1 (2%) | 1 (2%) |
| Hepatodiaphragmatic Nodule | 1 (2%) | 6 (12%) | 11 (22%) | 5 (10%) |
| Necrosis | | | 3 (6%) | 1 (2%) |
| Thrombosis | 1 (2%) | | | |
| Vacuolization Cytoplasmic | 3 (6%) | 1 (2%) | 2 (4%) | 1 (2%) |
| Bile Duct, Cyst | 1 (2%) | | | |
| Bile Duct, Dilatation | | | 1 (2%) | 1 (2%) |
| Bile Duct, Hyperplasia | | | 1 (2%) | |
| Hepatocyte, Regeneration | (13) | (9) | (10) | (7) |
| Mesentery | 13 (100%) | 9 (100%) | 10 (100%) | 5 (71%) |
| Necrosis | | | | 1 (14%) |
| Thrombosis | | | | |
| Fat, Hemorrhage | | 1 (11%) | | |
| Oral Mucosa | | (1) | | |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS MALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|----------------------------------|----------|----------|----------|----------|
| ALIMENTARY SYSTEM - CONT | | | | |
| Ulcer | | 1 (100%) | | |
| Pancreas | (50) | (50) | (49) | (50) |
| Acinus, Atrophy | | 1 (2%) | 1 (2%) | |
| Artery, Inflammation | | | (49) | 1 (2%) |
| Stomach, Fore stomach | (50) | (50) | (49) | (50) |
| Hyperplasia, Squamous | 2 (4%) | 1 (2%) | 2 (4%) | 4 (8%) |
| Inflammation, Suppurative | 1 (2%) | | | |
| Necrosis | | | 1 (2%) | |
| Ulcer | 3 (6%) | (50) | 3 (6%) | 4 (8%) |
| Stomach, Glandular | (50) | | (49) | (50) |
| Erosion | | | 3 (6%) | |
| Mineralization | | | 3 (6%) | |
| Necrosis | 1 (2%) | | 1 (2%) | 1 (2%) |
| Ulcer | | | | |
| Epithelium, Hyperplasia | | | | |
| Tongue | (2) | | (3) | 1 (2%) |
| Epithelium, Hyperplasia | 2 (100%) | | 3 (100%) | 1 (100%) |
| Tooth | (1) | (2) | | (1) |
| Malformation | | 1 (50%) | | |
| Periodontal Tissue, Inflammation | 1 (100%) | 1 (50%) | | 1 (100%) |

| | | | | |
|--|---------|---------|--------|---------|
| CARDIOVASCULAR SYSTEM | | | | |
| Blood Vessel | (50) | (50) | (49) | (50) |
| Pulmonary Artery, Degeneration, Muroid | | | 1 (2%) | |
| Heart | (50) | (50) | (49) | (50) |
| Cardiomyopathy | 7 (14%) | 6 (12%) | 4 (8%) | 7 (14%) |
| Inflammation, Focal, Suppurative | | | 1 (2%) | |
| Atrium, Thrombosis | 1 (2%) | | 1 (2%) | |
| Myocardium, Fibrosis | | | | |
| Myocardium, Necrosis | 1 (2%) | 1 (2%) | | |

| | | | | |
|---------------------------|---------|----------|----------|---------|
| ENDOCRINE SYSTEM | | | | |
| Adrenal Cortex | (50) | (50) | (49) | (50) |
| Hyperplasia | | 1 (2%) | | 3 (6%) |
| Mineralization | | | 1 (2%) | |
| Necrosis | 1 (2%) | | | |
| Vacuolization Cytoplasmic | 6 (12%) | 14 (28%) | 6 (12%) | 9 (18%) |
| Adrenal Medulla | (50) | (50) | (49) | (50) |
| Hyperplasia | 6 (12%) | 4 (8%) | 11 (22%) | 9 (18%) |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS MALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|---|------------------|------------------|------------------|------------------|
| ENDOCRINE SYSTEM - CONT | | | | |
| Thrombosis | (50) | (50) | 1 (2%) (49) | (50) |
| Islets, Pancreatic | | | 1 (2%) (48) | 1 (2%) (49) |
| Hyperplasia | (49) | (49) | (49) | (50) |
| Parathyroid Gland | 1 (2%) (50) | (50) | (49) | (50) |
| Hyperplasia | 1 (2%) (50) | 3 (6%) (49) | 1 (2%) (49) | 1 (2%) (50) |
| Pituitary Gland | 1 (2%) (50) | 1 (2%) (49) | 2 (4%) (48) | 2 (4%) (50) |
| Angiectasis | 1 (2%) (50) | 1 (2%) (49) | 4 (8%) (49) | 7 (14%) (50) |
| Atrophy | 1 (2%) (50) | 1 (2%) (49) | 7 (14%) (49) | 7 (14%) (50) |
| Cyst | 1 (2%) (50) | 1 (2%) (49) | 2 (4%) (48) | 1 (2%) (49) |
| Hemorrhage | 5 (10%) (50) | 2 (4%) (49) | 4 (8%) (49) | 2 (4%) (50) |
| Hyperplasia | 8 (16%) (50) | 4 (8%) (49) | 7 (14%) (49) | 7 (14%) (50) |
| Thyroid Gland | 1 (2%) (50) | 1 (2%) (49) | 2 (4%) (48) | 1 (2%) (49) |
| C-Cell, Hyperplasia | 1 (2%) (50) | 1 (2%) (49) | 2 (4%) (48) | 2 (4%) (50) |
| Follicular Cell, Hyperplasia | 1 (2%) (50) | 1 (2%) (49) | 7 (14%) (49) | 7 (14%) (50) |
| GENERAL BODY SYSTEM | | | | |
| None | | | | |
| GENITAL SYSTEM | | | | |
| Penis | | | (1) (49) | |
| Necrosis | | | 1 (100%) (49) | |
| Preputial Gland | (50) | (50) | 3 (6%) (49) | (50) |
| Hyperplasia | 2 (4%) (50) | 3 (6%) (49) | 4 (8%) (49) | (50) |
| Inflammation, Suppurative | 4 (8%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Prostate | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Hyperplasia | 31 (62%) (50) | 24 (48%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Inflammation, Suppurative | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Seminal Vesicle | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Dilatation | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Inflammation, Suppurative | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Epithelium, Hyperplasia | 1 (2%) (50) | 1 (2%) (49) | 27 (55%) (49) | 27 (54%) (50) |
| Testes | | | (49) | (50) |
| Bilateral, Interstitial Cell, Hyperplasia | 20 (40%) (50) | 19 (38%) (49) | 18 (37%) (49) | 20 (40%) (50) |
| Germinal Epithelium, Atrophy | 4 (8%) (50) | 3 (6%) (49) | 7 (14%) (49) | 7 (14%) (50) |
| Interstitial Cell, Hyperplasia | 4 (8%) (50) | 3 (6%) (49) | 7 (14%) (49) | 7 (14%) (50) |
| HEMATOPOIETIC SYSTEM | | | | |

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMIC SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

FISCHER 344 RATS MALE

CONTROL 75 PPM 300 PPM 1200 PPM

HEMATOPOIETIC SYSTEM - CONT

| | | | | |
|--|---------|---------|---------|---------|
| Lymph Node | (12) | (7) | (15) | (6) |
| Deep Cervical, Ectasia | | 1 (14%) | | |
| Deep Cervical, Hyperplasia, Lymphoid | 1 (8%) | | | |
| Deep Cervical, Inflammation | | 1 (14%) | | |
| Deep Cervical, Inflammation, Suppurative | | | | 1 (17%) |
| Pancreatic, Ectasia | 1 (8%) | | | |
| Pancreatic, Hemorrhage | | | 1 (7%) | |
| Pancreatic, Pigmentation | | | (9) | (21) |
| Lymph Node, Bronchial | (24) | (7) | 1 (11%) | |
| Hemorrhage | | | | 2 (10%) |
| Hyperplasia, Lymphoid | | | (49) | (50) |
| Lymph Node, Mesenteric | (50) | | | |
| Ectasia | | 1 (2%) | | |
| Fibrosis | | | | 1 (2%) |
| Lymph Node, Mediastinal | (38) | (41) | (46) | (45) |
| Angiectasis | 1 (3%) | 1 (2%) | 1 (2%) | |
| Hyperplasia, Lymphoid | 1 (2%) | 1 (2%) | | |
| Spleen | (50) | (50) | (49) | (50) |
| Accessory Spleen | 2 (4%) | 3 (6%) | 4 (8%) | 1 (2%) |
| Fibrosis | 5 (10%) | 1 (2%) | 7 (14%) | 4 (8%) |
| Hemorrhage | 1 (2%) | | 1 (2%) | 3 (6%) |
| Necrosis | 1 (2%) | 2 (4%) | 5 (10%) | 1 (2%) |

INTEGUMENTARY SYSTEM

| | | | | |
|--|--------|---------|---------|--------|
| Mammary Gland | (50) | (50) | (49) | (50) |
| Galactoceles | 3 (6%) | 2 (4%) | 2 (4%) | 1 (2%) |
| Metaplasia, Squamous | | 1 (2%) | | |
| Epithelium, Cyst, Squamous | | | | 1 (2%) |
| Skin | (50) | (50) | (49) | (50) |
| Cyst Epithelial Inclusion | 3 (6%) | 5 (10%) | 3 (6%) | 1 (2%) |
| Hyperkeratosis | 3 (6%) | 1 (2%) | 6 (12%) | 1 (2%) |
| Inflammation, Granulomatous | | | | 2 (4%) |
| Ulcer | 1 (2%) | | | 2 (4%) |
| Prepuce, Ulcer | | | 1 (2%) | |
| Sebaceous Gland, Hyperplasia, Squamous | 1 (2%) | | | |
| Subcutaneous Tissue, Hemorrhage | | | | 1 (2%) |

MUSCULOSKELETAL SYSTEM

| | | | | |
|------|------|------|------|------|
| Bone | (50) | (50) | (49) | (50) |
|------|------|------|------|------|

a Number of animals examined microscopically at site and number of animals with lesion

NTP Experiment-Test: 90004-07
 Study Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY

INCIDENCE RATES OF NONNEOPLASTIC LESIONS BY ANATOMICAL SITE (a)
 PROPYLENE GLYCOL MONO-T-BUTYL ETHER

Report: PEIRPT03
 Date: 03/05/03
 Time: 14:06:33

| FISCHER 344 RATS MALE | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
|--|----------|----------|----------|----------|
| MUSCULOSKELETAL SYSTEM - CONT | | | | |
| Fibrous Osteodystrophy | 1 (2%) | | | 1 (2%) |
| Cranium, Hemorrhage | | | (2) | (3) |
| Skeletal Muscle Mineralization | | | | 1 (33%) |
| NERVOUS SYSTEM | | | | |
| Brain | (50) | (50) | (49) | (50) |
| Compression | 7 (14%) | 4 (8%) | 5 (10%) | 3 (6%) |
| Gliosis | | | 1 (2%) | |
| Hemorrhage | 4 (8%) | 4 (8%) | 4 (8%) | 2 (4%) |
| RESPIRATORY SYSTEM | | | | |
| Larynx | (50) | (49) | (48) | (50) |
| Foreign Body | 1 (2%) | 2 (4%) | 1 (2%) | 1 (2%) |
| Inflammation, Chronic | 1 (2%) | | | 3 (6%) |
| Inflammation, Suppurative | | | | |
| Epiglottitis, Hyperplasia | | 2 (4%) | 1 (2%) | 1 (2%) |
| Epiglottitis, Metaplasia, Squamous | | 1 (2%) | 1 (2%) | 1 (2%) |
| Lung | (50) | (50) | (49) | (50) |
| Hemorrhage | 1 (2%) | 2 (4%) | 1 (2%) | 1 (2%) |
| Inflammation, Chronic | 5 (10%) | 2 (4%) | 5 (10%) | 4 (8%) |
| Inflammation, Suppurative | | | 1 (2%) | 2 (4%) |
| Necrosis, Focal | | | | |
| Alveolar Epithelium, Hyperplasia | 1 (2%) | 2 (4%) | 5 (10%) | 6 (12%) |
| Alveolar Epithelium, Metaplasia, Squamous | 6 (12%) | | | 4 (8%) |
| Alveolus, Foreign Body | 1 (2%) | | | 2 (4%) |
| Alveolus, Infiltration Cellular, Histiocyte | 11 (22%) | | 8 (16%) | 8 (16%) |
| Alveolus, Proteinosis | | 3 (6%) | | 2 (4%) |
| Artery, Mineralization | | 1 (2%) | | 4 (8%) |
| Artery, Thrombosis | | | | |
| Interstitialium, Fibrosis | | | 1 (2%) | 6 (12%) |
| Nose | 5 (10%) | 1 (2%) | 1 (2%) | 6 (12%) |
| Foreign Body | (50) | (49) | (49) | (50) |
| Hemorrhage | 6 (12%) | 6 (12%) | 4 (8%) | 3 (6%) |
| Inflammation, Chronic | | | | 1 (2%) |
| Inflammation, Suppurative | | | | 4 (8%) |
| Glands, Dilatation | 6 (12%) | 10 (20%) | 11 (22%) | 4 (8%) |
| Goblet Cell, Hyperplasia | 1 (2%) | 2 (4%) | 7 (14%) | 15 (30%) |
| Nasolacrimal Duct, Inflammation, Suppurative | 1 (2%) | 1 (2%) | 2 (4%) | 15 (30%) |
| | | | | 1 (2%) |

a Number of animals examined microscopically at site and number of animals with lesion

| | FISCHER 344 RATS MALE | | | |
|---|-----------------------|----------|----------|-----------|
| | CONTROL | 75 PPM | 300 PPM | 1200 PPM |
| RESPIRATORY SYSTEM - CONT | | | | |
| Olfactory Epithelium, Degeneration, Hyaline | | 25 (51%) | 45 (92%) | 50 (100%) |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | 4 (8%) | 1 (2%) |
| Respiratory Epithelium, Hyperplasia | 2 (4%) | 2 (4%) | 1 (2%) | 3 (6%) |
| Respiratory Epithelium, Metaplasia, Squamous | (49) | (50) | (49) | (50) |
| Pleura | 6 (12%) | 2 (4%) | 3 (6%) | 7 (14%) |
| Inflammation, Chronic | | (49) | (49) | 2 (4%) |
| Mesothelium, Hyperplasia | (50) | | | (50) |
| Trachea | | | | |
| Glands, Cyst | | | 1 (2%) | |

SPECIAL SENSES SYSTEM

| | | | | |
|---|--------|----------|--------|--------|
| Ear | | (1) | | (1) |
| Cyst | | 1 (100%) | | |
| Eye | (50) | (49) | (49) | (50) |
| Atrophy | | | | 1 (2%) |
| Hemorrhage | 1 (2%) | | | |
| Anterior Chamber, Inflammation, Suppurative | | | 1 (2%) | |
| Anterior Chamber, Cornea, Inflammation | | | | 1 (2%) |
| Anterior Chamber, Cornea, Inflammation, Suppurative | | | | 1 (2%) |
| Cornea, Inflammation, Suppurative | | | 1 (2%) | |

URINARY SYSTEM

| | | | | |
|--|----------|-----------|-----------|-----------|
| Kidney | (50) | (50) | (49) | (50) |
| Infarct | | 1 (2%) | | |
| Nephropathy, Chronic | 46 (92%) | 50 (100%) | 49 (100%) | 50 (100%) |
| Pigmentation | | | 1 (2%) | |
| Cortex, Infarct | 4 (8%) | | | |
| Cortex, Renal Tubule, Accumulation, Hyaline | | | | 2 (4%) |
| Droplet | 1 (2%) | 2 (4%) | 9 (18%) | 17 (34%) |
| Cortex, Renal Tubule, Hyperplasia | | 3 (6%) | 7 (14%) | 19 (38%) |
| Cortex, Renal Tubule, Necrosis | | | 1 (2%) | |
| Papilla, Mineralization | | 8 (16%) | 28 (57%) | 41 (82%) |
| Pelvis, Dilatation | 1 (2%) | | | |
| Pelvis, Inflammation, Suppurative | | | 1 (2%) | |
| Pelvis, Transitional Epithelium, Hyperplasia | 2 (4%) | 1 (2%) | 6 (12%) | 15 (30%) |
| Renal Tubule, Mineralization | 1 (2%) | | | |
| Renal Tubule, Pigmentation | 1 (2%) | | 2 (4%) | |
| Urethra | (1) | | (1) | (2) |

a Number of animals examined microscopically at site and number of animals with lesion